

AVESF



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August 7, 2000

Anchorage

Mr. Norm Linton  
Area Manager  
Potlatch Corporation  
1100 Railroad Avenue  
P.O. Box 386  
St. Maries, Idaho 83861

Boston

Re: Corrective Action Plan  
Avery Landing Site  
Avery, Idaho  
J-2296-07

Chicago

Denver

Dear Mr. Linton:

This report presents the Corrective Action Plan for Avery Landing Site in Avery, Idaho. The goal for this action is to stop migration of oil into the St. Joe River. The remedial method to ensure this goal is to excavate the existing shoreline and place an impermeable barrier upgradient of the river to block subsurface migration of free phase hydrocarbons (see Figure 1). Clean cover material would be placed over the impermeable barrier to restore the appearance and function of the shoreline. Figure 5 shows a generalized cross section of the repaired bank. The bottom elevation of the impermeable barrier will be sufficient to prevent migration of free phase hydrocarbons to the river, but not significantly impact the flow of groundwater.

Fairbanks

Jersey City

Complete removal of free product in shoreline soil will require excavation below the normal low water elevation of the St. Joe River. A temporary cofferdam (see Figure 2) using retainer blocks will be constructed to keep the St. Joe River from running through the construction area.

Juneau

Long Beach

To improve fish habitat during the shoreline restoration, four barbs will be constructed as shown on Figure 6. Additionally, the riparian zone above the riprap shoreline will be planted (see Figure 7).

Portland

The following sections describe the work to be completed in detail.



Seattle



## **SILT CONTROL AND CONTINGENCY SPILL PLAN**

During construction of the remedial action, release of silt and petroleum hydrocarbons to the environment will be controlled using retainer blocks, oil absorbent booms, an oil/water separator, and silt fences installed along a drainage ditch.

A retainer block cofferdam will be used to prevent the flow of water from the St. Joe River into the construction area (see Figure 1). Sandbags will be used to seal the retainer block wall and prevent the flow of water between adjacent blocks (see Figure 2). A dewatering pump will be used to remove water from the excavation area during construction. The water removed from the construction area behind the cofferdam will be run through an oil/water separator tank (Figure 3) and then released into a rock ditch with multiple silt fences. The effluent water will then drain back into the St. Joe River. Figure 1 depicts the general site layout and existing rock ditch. The oil/water separator (see Figure 3) will also act as a settling tank to help reduce turbidity in the water. Water quality of the discharge will be monitored visually. If the discharge becomes cloudy or obviously impacted with silt, the construction will be stopped until additional controls are installed and working.

An oil absorbent boom will be placed in the St. Joe River, outside of the retainer block cofferdam, to absorb and contain petroleum hydrocarbons in the event of a release to the river. This is the same procedure currently used at the site to control releases of petroleum products to the river. Additional oil absorbent booms will be available on site in the event of catastrophic failure of the retainer block cofferdam. In the event the cofferdam has to be unattended for more than one day, absorbent booms will be installed inside of the cofferdam to collect any material released from the shoreline.

## **WALL CONSTRUCTION**

Construction of the containment wall will require excavation of about 10 feet horizontally of the existing river bank. Five collection wells will be installed along the wall to remove free product that becomes trapped behind the containment wall. Figure 4 depicts the layout of the containment wall and collection wells. A liner will be placed along the cut-off wall to prevent migration of the free phase petroleum product but allow groundwater to flow beneath the wall to the St. Joe River. Riprap will be placed on the river-side of the cut-off wall to hold the liner in place, and provide suitable fish habitat.





### **Removal Activities**

The existing shoreline will be excavated to provide a stable slope from the top of the bank to 2 feet below the low water mark. In addition, five areas will be excavated into the slope to accommodate 2- to 3-foot-diameter 15-foot-long vertical collection wells. Native vegetation and existing soil will be retained to the extent possible for use in replanting the remediation area. Soil stained by contact with petroleum hydrocarbons will be stockpiled in an upland area of the site. The soils will be spread out in a thin layer to maximize natural attenuation of the contamination.

The construction water behind the cofferdam will be pumped to the oil/water separator to allow for the installation of the liner. Sheens on construction water will be removed using absorbent booms and pads. Every effort will be made to ensure no residual oil is left on the river side of the containment wall.

### **Liner Installation**

A 30-mil oil-resistant PVC alloy liner (Arctic Liner), or equivalent, will be used to prevent migration of petroleum hydrocarbons in the subsurface. The liner will be installed between two layers of 12-ounce non-woven geosynthetic fabric, or equivalent, to prevent puncturing the membrane during installation. A 6-inch bedding layer and a 6-inch cover layer will provide a uniform surface for placing the liner and cover materials. An 18-inch thick layer of crushed rock or clean fill will be placed over the cover layer as a base for the riprap layer. The placement of these materials is depicted on Figure 5.

### **Riprap Installation**

Large, two-man rocks (200 to 500 pounds each) will be placed along the cut-off wall, trailing into the river. The riprap will protect the cut-off wall from erosion and provide aquatic habitat. Once the riprap is installed, the retainer block cofferdam will be removed to restore normal stream flow in the St. Joe River.

Riprap barbs will be installed as shown on Figure 6 to break up the shoreline current and provide additional aquatic habitat. An excavator will place the riprap directly on the riverbed, disturbing the river bottom as little as possible.



## **RIPARIAN ZONE INSTALLATION**

The riparian zone installed above the cut-off wall will be planted with native vegetation to promote a natural appearance for the site. Native shrubs retained during the shoreline excavation will be placed along an 8- to 10-foot-wide strip of flat ground above the riprap wall (see Figure 7). Cottonwood and willow trees will be planted along the wall to provide shade to the river habitat.

## **LONG-TERM SITE MONITORING**

Monitoring in collection wells 1 and 5 (CW-1 and CW-5) will be required to ensure the free product captured by the wall does not build up to a thickness that could migrate around the end of the wall. Assuming a 10-foot smear zone CW-1 and CW-5 would require about 320 gallons of free product oil to fully saturate the 80 feet of soil between the collection well and the end of the wall. Based on a 3-foot-diameter collection well, the total thickness of free product allowed to collect in the well should not exceed 6 feet. Allowing for a long-term build-up of saturated soils and a safety factor of 6, the product in the well should be removed from the collection well whenever it exceeds 1 foot. If a 2-foot-diameter collection well is used, product should still be removed when the thickness exceeds 1 foot to limit the product gradient toward the end of the wall.

## **LIMITATIONS**

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Potlatch Corporation for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.





Potlatch Corporation  
August 7, 2000

J-2296-07  
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Any questions regarding our work and this letter report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

We trust that this report meets your needs.

Sincerely,

**HART CROWSER, INC.**

**TERRY W. MONTOYA**  
Project Manager

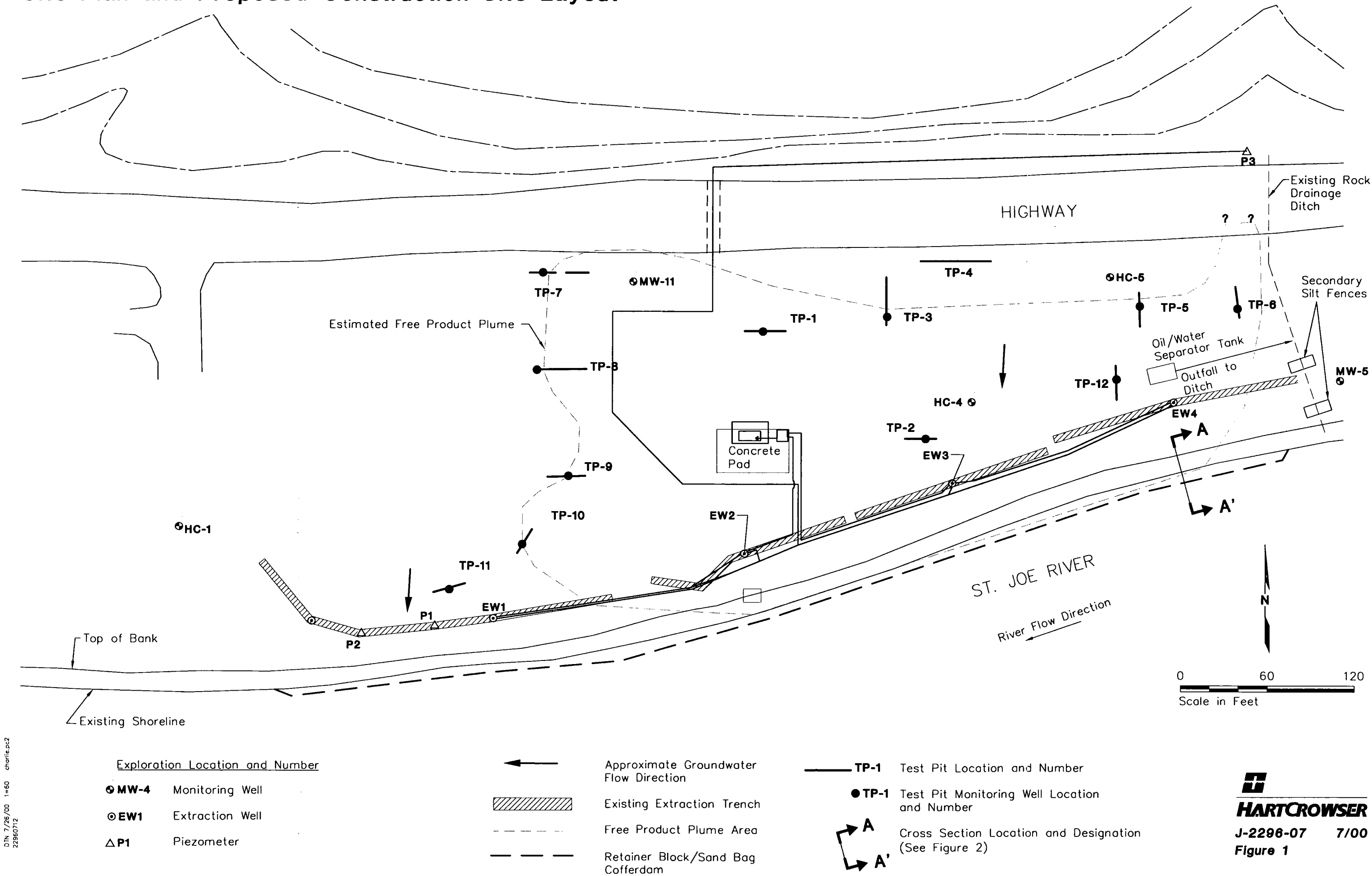
**MATTHEW F. SCHULTZ, P.E.**  
Sr. Associate Chemical Engineer

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Attachments:

- Figure 1 - Site Plan and Proposed Construction Site Layout
- Figure 2 - Retainer Block Cofferdam Detail
- Figure 3 - Oil/Water Separator Detail
- Figure 4 - Proposed Containment Wall Location
- Figure 5 - Containment Wall Detail
- Figure 6 - Barb Detail
- Figure 7 - Riparian Zone and Riprap Wall Area

Site Plan and Proposed Construction Site Layout

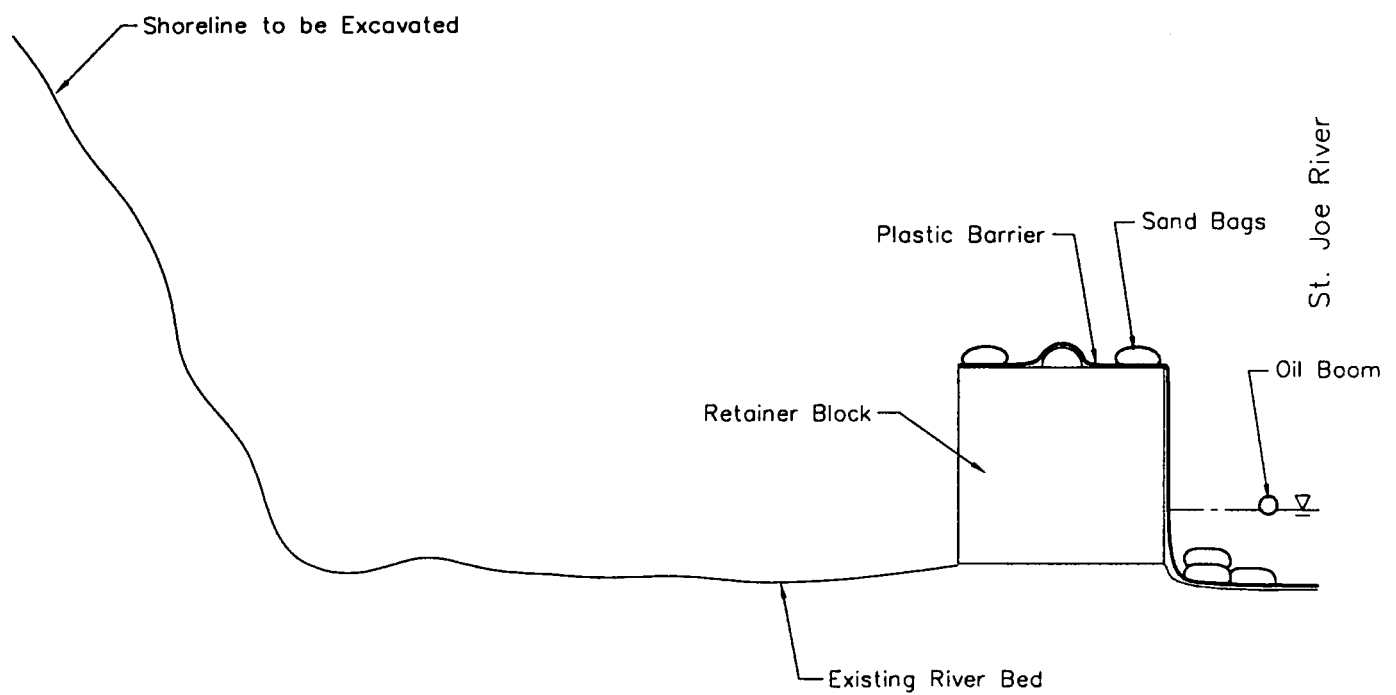


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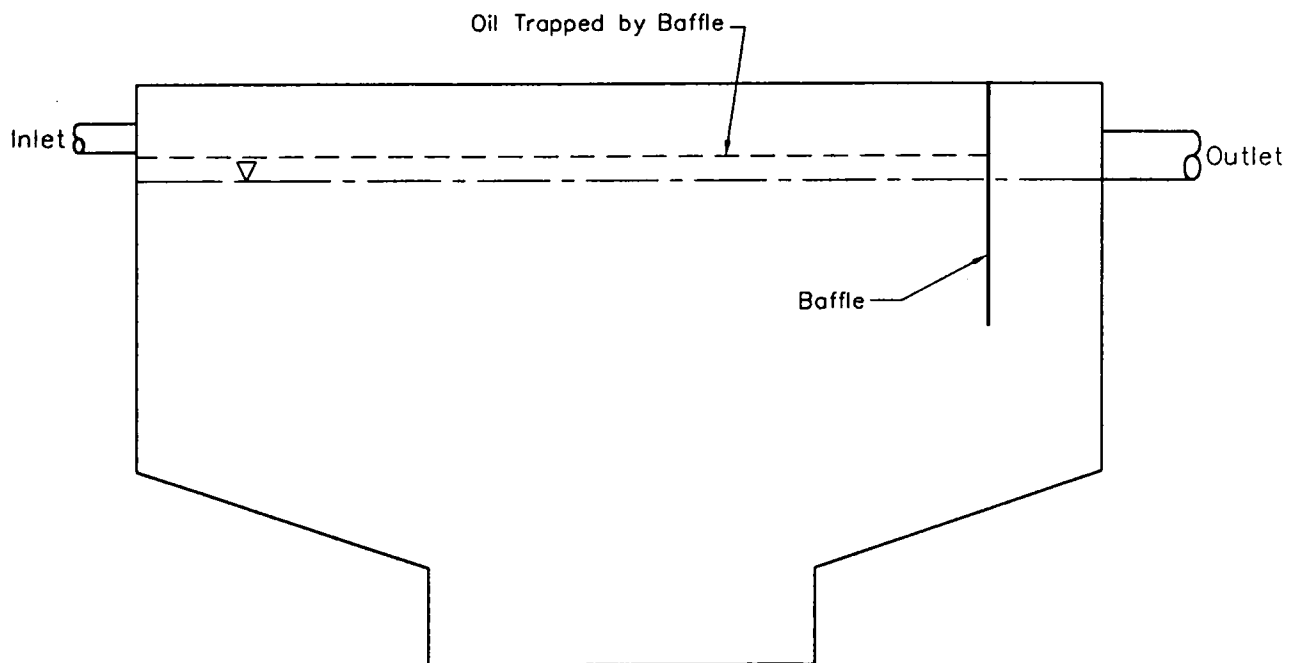
# Retainer Block Cofferdam Detail

## Cross Section A-A'



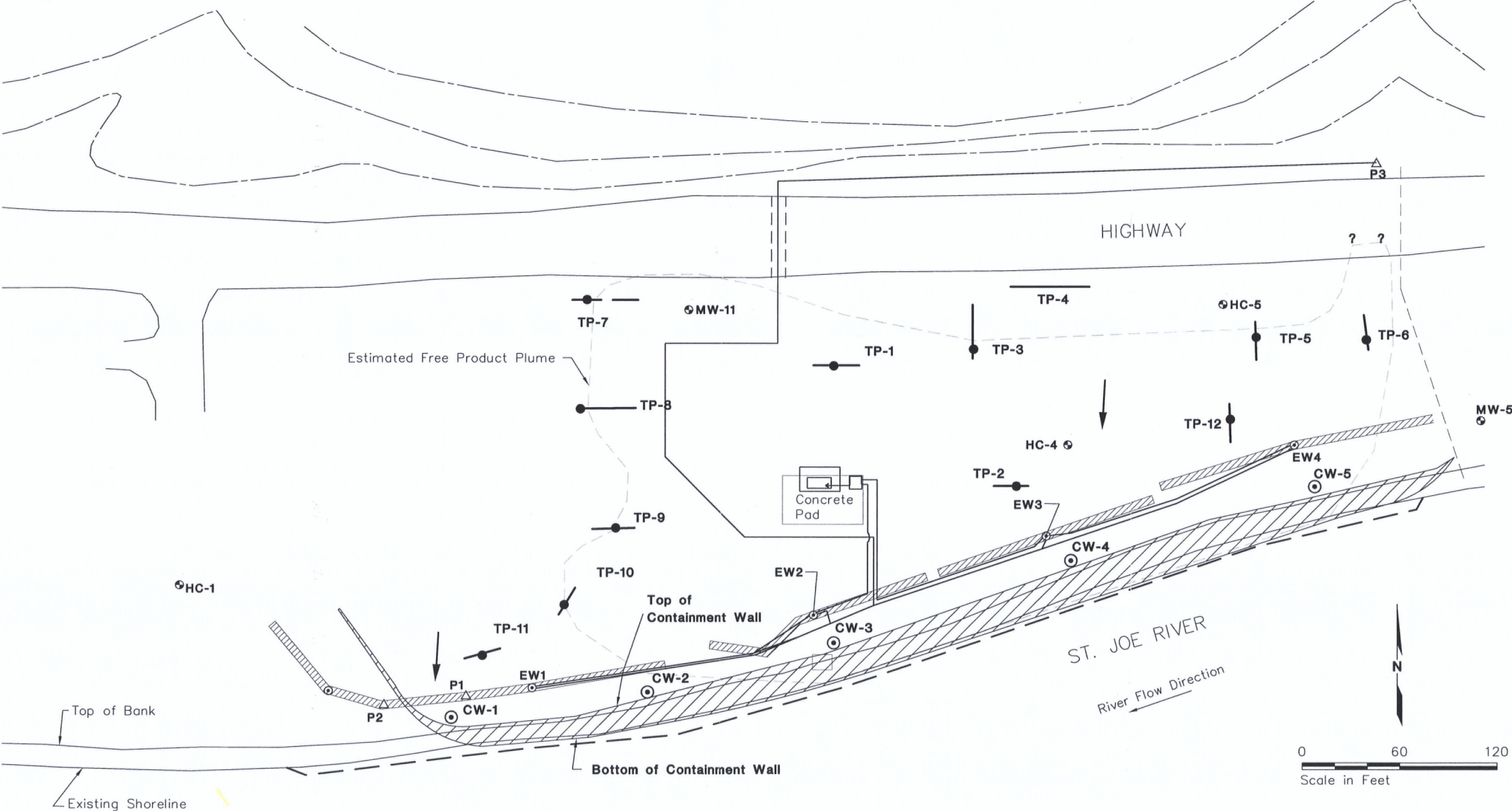
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# Oil/Water Separator Detail





Proposed Containment Wall Location



Exploration Location and Number

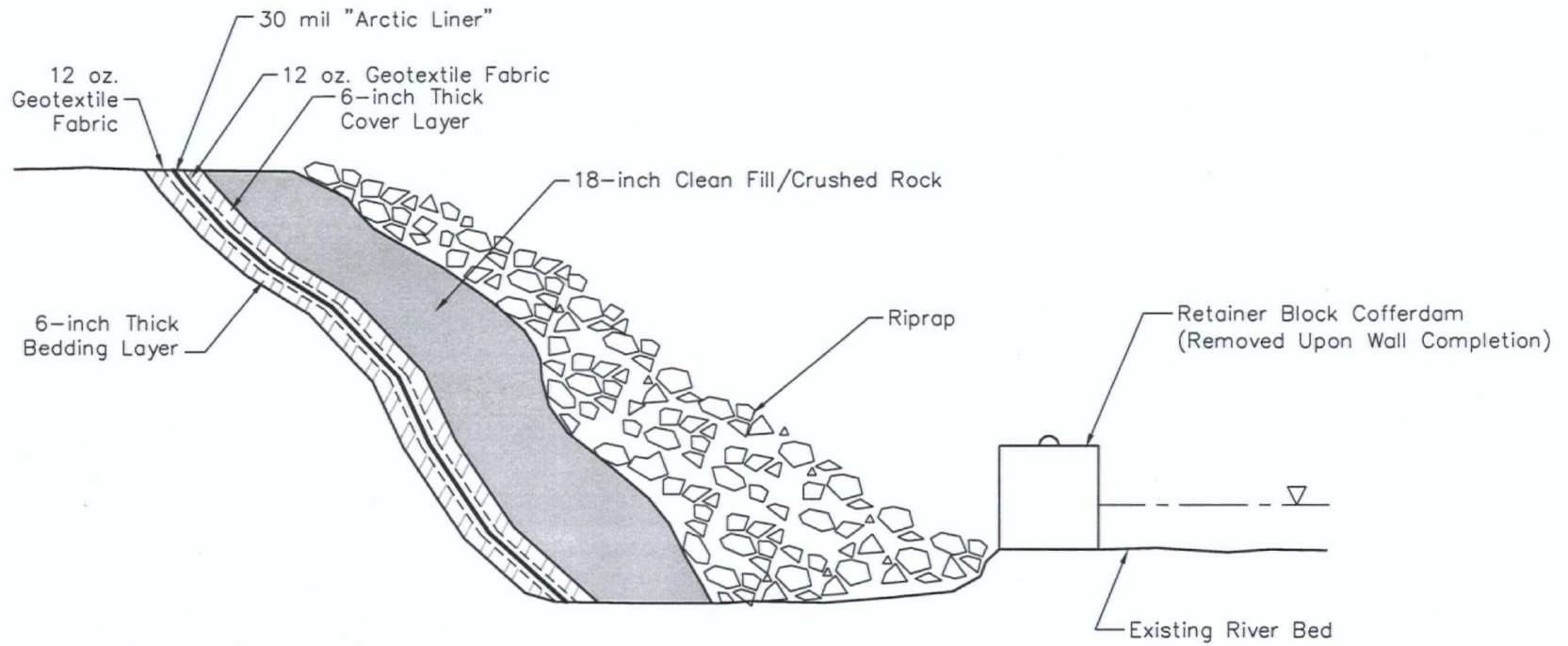
- MW-4 Monitoring Well
- ⊙ EW1 Extraction Well
- △ P1 Piezometer

- ← Approximate Groundwater Flow Direction
- ▨ Existing Extraction Trench
- - - Free Product Plume Area
- - - Retainer Block/Sand Bag Cofferdam

- TP-1 Test Pit Location and Number
- TP-1 Test Pit Monitoring Well Location and Number
- ⊙ CW-1 Collection Well Location and Number
- ▨ Proposed Containment Wall

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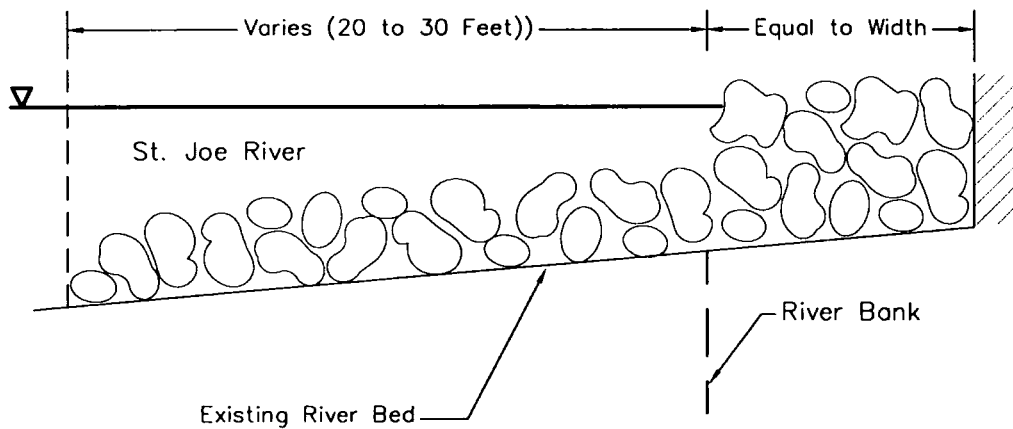
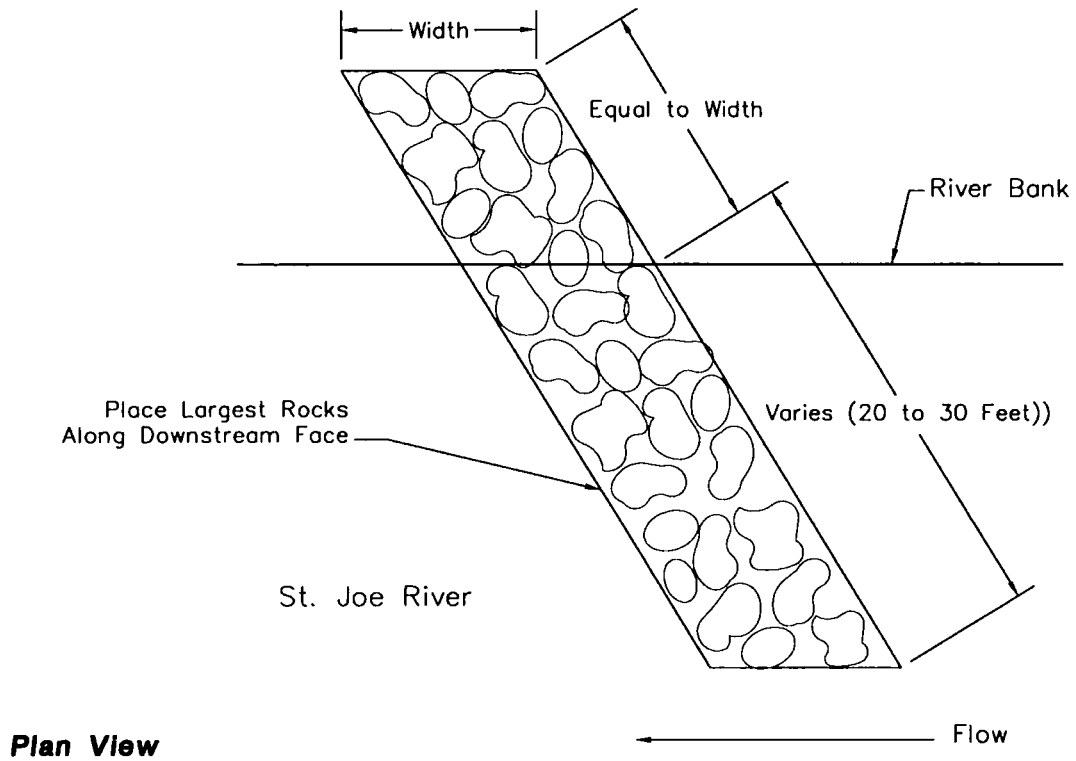
# Containment Wall Detail



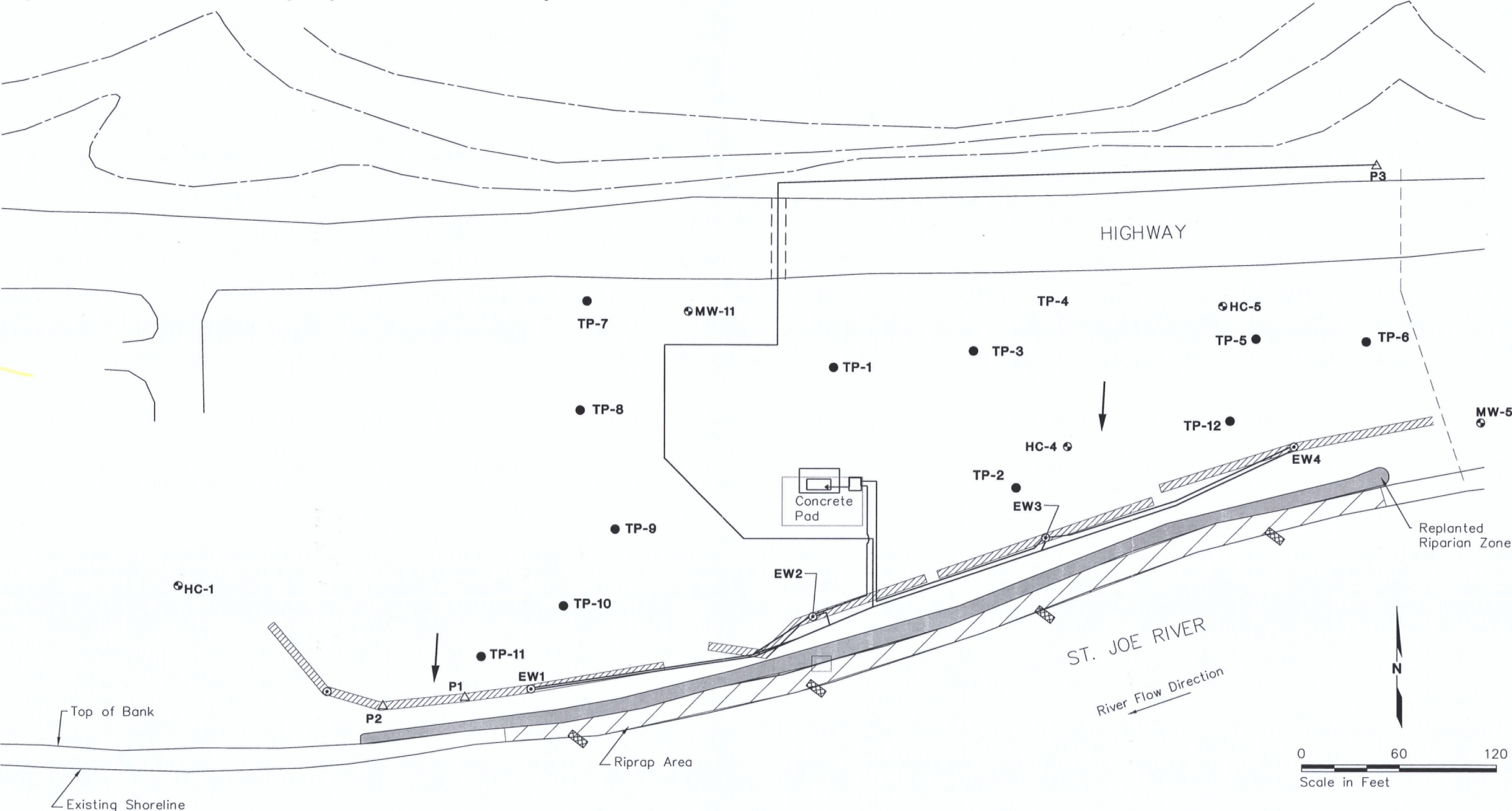
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# Barb Detail



Riparian Zone and Riprap Wall Area Map



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